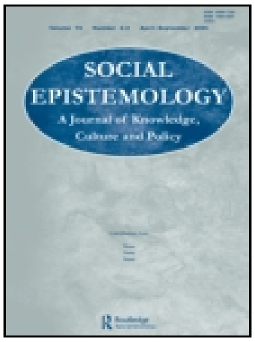

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Fuller on Kuhn*

ROBERTO TORRETTI

According to Steve Fuller, ‘a common thread that runs through the formal and informal comments that people make about [Kuhn’s] *Structure* is that it is quite thin on matters in their own field of expertise, but truly enlightening in some other field . . .’ (p. 32). ‘Certainly, the book itself does not encourage deep reading’ (p. 31). Its ‘cross-disciplinary appeal is founded on its ability to compel readers without demanding too much engagement in return’ (p. 31). Why did Fuller think it worth his while to write almost 500 pages about such a book? The answer is, I guess, that Fuller’s book is not just about Kuhn’s. It purports to tell ‘the saga of how the West developed so as to make *The Structure of Scientific Revolutions* the most “natural” way of understanding the premier knowledge production practices of the late twentieth century’ (p. 32).

The narration begins with a dull and diffuse chapter on ‘The Pilgrimage from Plato to NATO’, which would have caused me to drop the book if I had not promised to review it. Next comes a moderately illuminating report on the Mach–Planck debate about the aims of science and its relations to society. While Mach the instrumentalist—for whom science’s sole purpose was economy of thought for the sake of human welfare—favoured democratic scrutiny and regulation of scientific research, Planck the realist—who saw science as reaching for truth about the nature of things—would rather place the pursuit of scientific inquiry under the purview of the expert few, while the mass of taxpayers quietly supported every demand made in the name of science’s self-justifying goal. From then on attention is focused on American science, politics, and higher education, until it leaps back to Europe for the discussion of Popper and Lakatos in Chapter VI, and of the Edinburgh and Parisian schools of social studies of science in Chapter VII. To give an inkling of the drift of Fuller’s narrative, I shall summarise a few salient points.

According to Fuller, the key to the formation of Kuhn’s renowned vision of science must be sought in his collaboration with James Conant *ca.* 1950. Conant, a professor of chemistry, was the President of Harvard from 1933 to 1955, when he became the first American ambassador to the German Bundesrepublik. He created the General Education courses in science in which Kuhn had his first teaching assignment. Conant was also one of the founders of the system of peer

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review adopted in post-war America for the public funding of scientific research; which, Fuller notes (p. 162), has had the effect that '50 percent of federal funding of science today goes to a mere *thirty-three* (of a possible twenty-five hundred) institutions of higher education in the United States'. Conant's courses were mainly for non-scientists and their purpose was to raise consciousness of the meaning and role of science amid future members of the American power elite. Fuller pointedly asks: 'If the value of scientific work can be judged only by fellow scientists, then how exactly is the General Education curriculum supposed to contribute to decision making about science in a democracy?' (p. 217). He concludes that its 'ultimate goal' was 'a lay public capable of discriminating between instances of ["pure" and "applied"] research—a public conditioned to see the dirt on one set of hands but not on the other' (p. 218). Given the difficulty of teaching twentieth-century science to non-specialists, Conant's courses focused on earlier science. Thus, 'the incommensurability that exists between today's scientists and students is bridged by having students observe historical cases of science as simulations of how science is performed today' (p. 183). Kuhn's *Structure* also avoids examples from today's Big Science, while falsely suggesting that it is merely a continuation of older science as conceived in that book. 'One would never suspect, just from reading Kuhn, that scientific instruments cost money to design and manufacture and that scientific problems require institutional protection and incentives for their sustained pursuit. Moreover, Kuhn would hardly give one reason to believe that this pursuit might itself have consequences . . . on the society in which it was housed' (p. 216).

Turning from the sources to the impact of *Structure*, Fuller stresses that it did not influence the same circles as Conant's writings. While the latter 'persuaded U.S. government officials and much of the educated public to support the funding of pure science without requiring too much accountability in return, *Structure* occluded the tensions latent in Conant's vision for the potentially more critical audience that was brewing within the academy, namely professional social scientists . . .' (p. 227). They were attracted to Kuhn's book because it gave them 'a blueprint for how a community of inquirers can constitute themselves as a science, *regardless* of their subject matter' (p. 234). Ironically, by organising their work around 'self-contained paradigms', the social scientists were 'decreasing the likelihood of their having *any* impact . . . on the powers that be' (p. 234).

Chapter VI, subtitled 'Philosophy after Kuhn', discloses the author's poor understanding of philosophical literature. This is unfortunate, for it may well lessen the impact of his insights, e.g. 'that Kuhn's book constituted . . . less a revolt against positivism, than a continuation of positivism by other means' (p. 287); or that the close study of the scientific working place by some Kuhn-inspired sociologists 'seems to show . . . that no obvious empirical place can be found in scientific practice for the methodological norms so cherished by philosophers' (p. 290).

Chapter VII, 'Kuhnification as Ritualized Political Impotence', gives us an instructive insider's view of Social and Technology Studies (STS). People in this field typically take *Structure* 'as a founding text, the content of which is sometimes read as a blueprint for organising the field's research agenda' (p. 321). Because of it they typically suffer from the same methodological failings of Kuhn's book, where 'one model, adapted largely from physics', and based roughly on three centuries of European history (1620–1920), 'is presented as the model of all the sciences' (p. 321); a book that—apart from the socialisation of novices 'into the practice of normal science;—pays no attention to 'the macro- and microsocial character of science', nor 'to its economic and technological dimensions' (p. 322). According to Fuller, 'this Kuhnian legacy has made the study of science a relatively self-contained project, innocent of any obvious interest in providing a comprehensive theory of society' (p. 323). 'In short, STS seems to have inherited from Kuhn . . . a sense of normative confusion, an incapacity to pronounce on whether it likes or dislikes what it so perspicuously sees' (p. 348). 'Not surprisingly, STS practitioners have endured an uneasy relationship with Marxist and feminist science critics' (p. 347).

Chapter VIII, 'Conclusions', begins with a brilliant recapitulation of Kuhn's formative period, and for a moment I thought I would recommend readers like me, impatient with Fuller's meandering, to read this chapter only. But after a few pages Fuller, who obviously has no truck with conventional academic composition, backs away from the self-assigned task of drawing conclusions and yields to his fondness for oracular hermeneutical pronouncements. The broad semantic spectrum of 'paradigm', which Kuhn sought to remedy after Margaret Masterman famously chided him for it, is here enriched with a startling addition. Fuller urges 'that we turn Kuhn on his head and demonstrate that a paradigm is nothing more than an arrested social movement' (p. 402), which presupposes, of course, that a Kuhnian paradigm *is* indeed a social movement. Another linguistic innovation is the neologism *culturopath*,[1] which Fuller would apply to people—including Kuhn himself—who 'lack reflexive engagement with what they say and do', and therefore 'go through life as if in a vacuum or a bubble' (p. 398). 'Academic training unwittingly renders its subjects susceptible to this disorder while preparing a "universal class" of pure inquirers: the so-called Ivory Tower mentality' (p. 398). By contrast, Fuller's own condition is what one might call *culturergic*: 'The task before us academics is to reverse the image of the university . . ., so that instead of being an institution that must be forced from the outside to change, the university becomes the site where major social change is initiated' (p. 421).

I should say I am vexed by Fuller's handling of some matters of fact. I understand that a 'devout social constructivist' like him (p. xvi) need not pay attention to Truth with a capital T, which anyway does not exist in his eyes. But a historian's contempt of little truths undermines the reader's trust. Of course, I can only judge Fuller's accuracy within the narrow field with which I am conversant. I have collected a few telling examples. (1) On p. 208, Newtonian mechanics is described as the first 'paradigm' of physics 'after Galileo's ground clearing', i.e. the first ' "exemplar" that self-consciously set out to replace the entire apparatus of ancient cosmology'. However, *Principia* fights Descartes, not Aristotle or Ptolemy (Keplerian astronomy is *taken for granted*). (2) The statement on p. 251 concerning 'every major political theorist before Marx' entails that Aquinas, Ockam, Victoria, Suárez, Pufendorf, Adam Smith, Kant and Fichte never held a university chair; and that Montesquieu, Hume, Madison, Hamilton, Jefferson, Bentham and Tocqueville depended for their livelihood on 'their ability to influence political leaders or their mentors'. (3) On p. 391, n. 21, we are told that, while Nancy Cartwright draws much inspiration from Aristotle, she hardly mentions him; a quick glance at the index of *Nature's Capacities and their Measurement* (Oxford: Clarendon, 1989) will suffice to verify that Fuller's remark is unjustified. (4) We read on p. 268 that the 'Kantian distinction between "the given" that we experience of reality and the "conceptual scheme" that makes sense of it' can be described 'in Kant's own terms, [as] the difference between "synthetic" and "analytic" statements'. (5) On the next page we learn that 'philosophers' favorite example of an analytic statement' is '2 + 2 = 4'. Should we assume that in this context Kant does not count as a philosopher? (5) On p. 278 we find this quotation from Quine: 'The issue over there being classes seems more a question of convenient conceptual scheme; the issue over there being centaurs, or brick houses on Elm Street, seems more a question of fact'. According to Fuller (p. 279) the comparison here is between a statement like 'there are no brick houses on Elm Street', which expresses 'the failure to observe one member of a class', and a statement like 'there are brick houses', which concerns 'the existence of that class'. Confronted with this enormity I realised that there are small matters of fact that must be heeded even in textual interpretation.

I was also fatigued by Fuller the philopsogue.[2] Consider this example. Commenting on 'the sharing of data and credit that distinguishes true scientists from the industrial researchers who keep trade secrets in order to protect their company's profits', he writes: 'Despite the scent of sanctity surrounding this distinction, it is worth noting that such "sharing" amounts to paying mafia-style protection money. Scientists cannot afford *not* to share with their colleagues. Otherwise, colleagues will not share with them, approve their grants, or hire their students' (224f., n. 105). I do not deny that Fuller is often right on the mark, but there comes a point when such relentless all-round deprecation gets on one's nerves.

Readers of this journal should be told that Fuller cites few issues from the history of physics and never goes into their substance. Let me give an example. In a famous paper of 1927 and again in his Chicago lectures of 1930, Werner Heisenberg tried to make the quantum-mechanical indeterminacy relations plausible to his audience through some remarks on the perturbation of physical objects by the human act of measurement. To Steven Weinberg such remarks are ill advised and show that the great German physicist 'could not always be counted on to think carefully'. Fuller comments: 'The confidence with which Weinberg separates self-serving wheat from inconvenient chaff marks the openness with which the sort of historical philistinism licensed by Planck and Kuhn is practiced by scientists today' (p. 128). Yet a quick glance at the actual import of the Heisenberg indeterminacy relations and the way they flow from the quantum-mechanical representation of conjugate dynamical quantities by non-commutative linear operators should persuade Fuller that those relations do not depend on a pretended interaction between 'subject' and 'object', not to mention the fact that the Heisenberg remarks in question only make sense if one continues to think in pre-quantum-mechanical terms.

Finally, I wish to make clear that, notwithstanding the numerous and lengthy footnotes and the large and very useful reference list, this book is not and does not want to be a standard piece of scholarship. It does not seek the reader's acquiescence to results of inquiry, but her or his adhesion to a cause. To obtain this, it relies not so much on the strength of argument and evidence as on sheer moral pressure. The genre is not new and even someone like me, who scoffs at all schemes of political improvement, can occasionally enjoy it, if only—as in the case of Nietzsche—the excellent prose makes up for the onslaught of self-righteousness. However, Fuller is no Nietzsche, and although—as my quotations show—he is capable of writing mildly memorable sentences, he packs others in encrypted socioscript.[3]

Notes

1. I presume that Fuller first thought of *pedopath* (from *paideia*, ‘culture’, and *pathos*, ‘affection’), which is linguistically more consistent and thus closer to the medical terms that he apes. But psychopaths have managed to make the prefix *pedo-* a harbinger of obscenity.
2. Allow me to coin this Graecism on the analogy of ‘pedagogue’ (from *paidagogos*). A *philopsogos* is one who loves fault-finding (*psogos*), who relishes spreading blame all around; cf. Euripides, *Phoenissae*, 198; Plato, *Protagoras*, 346c.
3. The following passage is extreme but not wholly atypical: ‘It is self-serving to infer the democratisation of science from its rootedness in a specific form of labor, if we do not also observe that both experts and nonexperts are ignorant and fated in sufficiently similar ways that we would *all* be better off pursuing an epistemology that avoided irreversible error than one purporting to determine what we can know with certainty’ (p. 317).